Induced pluripotent stem cells and embryonic stem cells are distinguished by gene expression signatures.

Journal:	Cell Stem Cell
Publication Year:	2009
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PubMed link:	19570518
Funding Grants:	Role of Mitochondria in Self-Renewal Versus Differentiation of Human Embryonic Stem Cells, Generation of clinical grade human iPS cells, Modeling Human Embryonic Development with Human Embryonic Stem Cells , In vitro reprogramming of mouse and human somatic cells to an embryonic state

Public Summary:

Scientific Abstract:

Induced pluripotent stem cells (iPSCs) outwardly appear to be indistinguishable from embryonic stem cells (ESCs). A study of gene expression profiles of mouse and human ESCs and iPSCs suggests that, while iPSCs are quite similar to their embryonic counterparts, a recurrent gene expression signature appears in iPSCs regardless of their origin or the method by which they were generated. Upon extended culture, hiPSCs adopt a gene expression profile more similar to hESCs; however, they still retain a gene expression signature unique from hESCs that extends to miRNA expression. Genome-wide data suggested that the iPSC signature gene expression differences are due to differential promoter binding by the reprogramming factors. High-resolution array profiling demonstrated that there is no common specific subkaryotypic alteration that is required for reprogramming and that reprogramming does not lead to genomic instability. Together, these data suggest that iPSCs should be considered a unique subtype of pluripotent cell.

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